

THE WESTERN Journal of Medicine

Since 1902

(ISSN 0093-0415)

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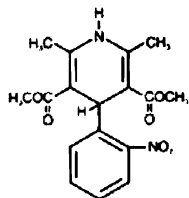
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"Entered as second class matter at the post office in San Francisco under the Act of March 3, 1879." Acceptable for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 10, 1918. Publication Number 084480.

For Oral Use

DESCRIPTION: PROCARDIA (nifedipine) is an antianginal drug belonging to a new class of pharmacological agents, the calcium channel blockers. Nifedipine is 3,5-pyridinedicarboxylic acid, 1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl)-, dimethyl ester, $C_{17}H_{19}N_2O_6$, and has the structural formula:



Nifedipine is a yellow crystalline substance, practically insoluble in water but soluble in ethanol. It has a molecular weight of 346.3. PROCARDIA CAPSULES are formulated as soft gelatin capsules for oral administration each containing 10 mg nifedipine.

CLINICAL PHARMACOLOGY: PROCARDIA (nifedipine) is a calcium ion influx inhibitor (slow channel blocker or calcium ion antagonist) and inhibits the transmembrane influx of calcium ions into cardiac muscle and smooth muscle. The contractile processes of cardiac muscle and vascular smooth muscle are dependent upon the movement of extracellular calcium ions into these cells through specific ion channels. PROCARDIA selectively inhibits calcium ion influx across the cell membrane of cardiac muscle and vascular smooth muscle without changing serum calcium concentrations.

Mechanism of Action: The precise means by which this inhibition relieves angina has not been fully determined, but includes at least the following two mechanisms:

but fully confirmed, reduction of coronary artery spasm. PROPCARDIA dilates the main coronary arteries and coronary arterioles, both in normal and ischemic regions, and is a potent inhibitor of coronary artery spasm, whether spontaneous or ergonovine-induced. This property increases myocardial oxygen delivery in patients with coronary artery spasm, and is responsible for the effectiveness of PROPCARDIA in vasospastic (Prinzmetal's or variant) angina. Whether this effect plays any role in classical angina is not clear, but studies of exercise tolerance have not shown any difference between treatment with ergonovine or propanolol, with or without a moderate oxygen utilization. This suggests that, in general, relief of spasm/dilation of coronary arteries is not an important factor in classical angina.

2) Reduction of oxygen utilization: PROCARDIA regularly reduces arterial pressure at rest and at a given level of exercise by dilating peripheral arterioles and reducing the total peripheral resistance (afterload) against which the heart works. This unloading of the heart reduces myocardial energy consumption and oxygen requirements and probably accounts for the effectiveness of PROCARDIA in chronic stable angina.

Pharmacokinetics and Metabolism: PROCARDIA is rapidly and fully absorbed after oral administration. The drug is detectable in serum 10 minutes after oral administration, and peak blood levels occur in approximately 30 minutes. It is highly bound by serum proteins. PROCARDIA is extensively converted to inactive metabolites and approximately 80% of PROCARDIA and metabolites are eliminated via the kidneys. The half-life of nifedipine in plasma is approximately two hours. There is no information on the effects of renal or hepatic impairment on excretion or metabolism of PROCARDIA.

Background: In humans, α_1 -adrenoceptor blockers, PROCARDIA exerts a negative inotropic effect on the failing myocardium. This is rarely, if ever, seen in intact animals or man, probably because of reflex responses to its vasodilating effects. In man, PROCARDIA causes decreased peripheral vascular resistance and a fall in systolic and diastolic pressure, usually modest (5–10 mm Hg systolic), but sometimes larger. There is usually a small increase in heart rate, a reflex response to vasodilation. Measurements of cardiac function in patients with normal ventricular function have generally found a small increase in cardiac index without major effects on ejection fraction, left ventricular end diastolic pressure (LVEDP) or volume (LVEDV). In patients with impaired ventricular function, most acute studies have shown some increase in ejection fraction and reduction in left ventricular filling pressure.

Electrophysiologic Effects: Although, like other members of its class, PROCARDIA decreases sinoatrial node function and atrioventricular conduction in isolated myocardial preparations, such effects have not been seen in studies in intact animals or in man. In formal electrophysiologic studies, predominantly in patients with normal conduction systems, PROCARDIA has had no tendency to prolong atrioventricular conduction, prolong sinus node recovery time, or slow sinus rate.

INDICATIONS AND USAGE: 1. Vasospastic Angina: PROCARDIA (nifedipine) is indicated for the management of vasospastic angina confirmed by any of the following criteria: 1) classical pattern of angina at rest accompanied by ST segment elevation, 2) angina or coronary artery spasm provoked by ergonovine or 3) angiographically demonstrated coronary artery spasm. In those patients who have had angiography, the presence of significant fixed obstructive disease is not incompatible with the diagnosis of vasospastic angina, provided that the above criteria are satisfied. PROCARDIA may also be used where the clinical presentation suggests a possible vasospastic component but where vasospasm has not been confirmed, e.g., where pain has a variable threshold or is intractable angina where radiocardiographic findings are compatible with transient vasospasm, or when angina refractory to nitrates and/or adequate doses of beta blockers.

II. Chronic Stable Angina (Classical Effort-Associated Angina): PROCARDIA is indicated for the management of chronic stable angina (effort-associated angina) without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or organic nitrates or who cannot tolerate those agents.

In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in these patients are incomplete.

Controlled studies in small numbers of patients suggest concomitant use of PROCARDIA and beta-blocking agents may be beneficial in patients with chronic stable angina, but available information is not sufficient to predict with confidence the effects of concurrent treatment, especially in patients with compromised left ventricular function or cardiac conduction abnormalities. When introducing such concomitant therapy, care must be taken to monitor blood pressure since severe hypotension can occur from the combined effects of the drugs. See Warnings.

CONTRAINDICATIONS: Known hypersensitivity reaction to PROCARDIA.
WARNINGS: Excessive Hypotension: Although in most patients, the hypotensive effect of PROCARDIA is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Increased Angina/Beta Blocker Withdrawal: Occasional patients have developed well documented increased frequency, duration or severity of angina on starting PROCARDIA or at the time of dosage increases. The mechanism of this response is not established but could result from decreased coronary perfusion associated with decreased diastolic pressure with increased heart rate, or from increased demand resulting from increased heart rate alone.

Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of PROCARDIA treatment will not prevent this occurrence and might be expected to exacerbate it by provoking reflex catecholamine release. There have been occasional reports of increased angina in a setting of beta blocker withdrawal and PROCARDIA initiation. It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning PROCARDIA.

Congestive Heart Failure: Rarely, patients usually receiving a beta blocker have developed heart failure after beginning PROCARDIA. Patients with tight aortic stenosis may be at greater risk for such an event, as the unloading effect of PROCARDIA would be expected to be of less benefit to these patients, owing to their fixed impedance to flow across the aortic valve.

PRECAUTIONS: General: Hypotension: Because PROCARDIA decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of PROCARDIA is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. See Warnings.

Peripheral edema: Mild to moderate peripheral edema, typically associated with arterial vasodilation and not due to left ventricular dysfunction, occurs in about one in ten patients treated with PROCARDIA. This edema occurs primarily in the lower extremities and usually responds to

diuretic therapy. With patients whose angina is complicated by congestive heart failure, it should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Drug Interactions: Beta-adrenergic blocking agents: See Indications and Warnings. Experience in over 1400 patients in a non-comparative clinical trial has shown that concomitant administration of PROCARDIA and beta-blocking agents is usually well tolerated, but there have been occasional reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension or exacerbation of angina.

Long-acting nitrates: PROCARDIA may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antianagical effectiveness of this combination.

Carcinogenesis, mutagenesis, impairment of fertility: Nifedipine was administered orally to rats for two years and was not shown to be carcinogenic. When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose. In vivo mutagenicity studies were negative.

Pregnancy: Pregnancy category C. Nifedipine has been shown to be teratogenic in rats and mice given in doses 30 times the maximum recommended human dose. Nifedipine was embryocidal (increased fetal resorptions, decreased fetal weight, increased stunted forms, increased fetal deaths, decreased neonatal survival) in rats, mice and rabbits at doses of from 3 to 10 times the maximum recommended human dose. In pregnant monkeys, doses 2/3 and twice the maximum recommended human dose resulted in small placentas and underdeveloped chorionic villi. In rats, doses three times the maximum human dose and higher caused prolongation of pregnancy. There are no adequate and well-controlled studies in pregnant women. PROCARDIA should

ADVERSE REACTIONS: In multiple-dose U.S. and foreign-controlled studies in which adverse reactions were reported spontaneously, adverse effects were frequent but generally not serious and rarely required discontinuation of therapy or dosage adjustment. Most were expected consequences of the vasodilator effects of PROCARDIA.

	PROCARDIA (%) (N = 226)	Placebo (%) (N = 226)
Dizziness, light-headedness, giddiness	27	15
Flushing, heat sensation	25	20
Headache	23	8
Weakness	12	10
Nausea, heartburn	11	8
Muscle cramps, tremor	8	3
Peripheral edema	7	1
Nervousness, mood changes	7	4
Palpitation	7	5
Dyspnea, cough, wheezing	6	3
nasal congestion, sore throat	6	8

The patients had symptomatic or asymptomatic controlled experience on over 2100 patients in the United States. Most of the patients had vasospastic or resistant angina pectoris, and about half had concomitant treatment with beta-adrenergic blocking agents. The most common adverse events were the ones seen in the controlled trials, with dizziness or light-headedness, peripheral edema, nasal weakness, headache and flushing each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%. Syncopal episodes did not occur with reduction in the dose of PROCARDIA or concomitant antihypertensive medication. Very rarely, hypotension and syncope during therapy was associated with an increase in anginal pain, possibly unclassified hypotension.

Several of these side effects appear to be dose related. Peripheral edema occurred in about one in 25 patients at doses less than 60 mg per day and in about one patient in eight at 120 mg per day or more. Transient hypotension, generally of mild to moderate severity and seldom requiring discontinuation of therapy, occurred in one of 50 patients at less than 60 mg per day and in one of 20 patients at 120 mg per day or more.

In addition, 2% or fewer of patients reported the following: Respiratory: Nasal and chest congestion, shortness of breath. Gastrointestinal: Diarrhea, constipation, cramps, flatulence. Musculoskeletal: Inflammation, joint stiffness, muscle cramps. CNS: Shakiness, nervousness, tremor, sleep disturbances, blurred vision, difficulties in balance. Other: Dermatitis, pruritus, ticaria, fever, sweating, chills, sexual difficulties.

In addition, more serious adverse events were observed, not readily distinguishable from natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients, congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

In a subgroup of over 1000 patients receiving PROCARDIA with concomitant beta blocker therapy, the pattern and incidence of adverse experiences was not different from that of the entire group of PROCARDIA treated patients (see Precautions).

In a subgroup of patients with a diagnosis of congestive heart failure as well as angina, dizziness or light-headedness, peripheral edema, headache or flushing each occurred in one in 10 patients. Hypotension occurred in about one in 20 patients. Syncope occurred in approximately one patient in 250. Myocardial infarction or symptoms of congestive heart failure each occurred in about one patient in 15. Atrial or ventricular dysrhythmias each occurred in about one patient in 150.

Laboratory tests: Rare, mild to moderate, transient elevations of enzymes such as alkaline phosphatase, CK, LDH, SGOT, and SGPT have been noted, and a single incident of significant elevated transaminases and alkaline phosphatase was seen in a patient with a history of bladder disease after about eleven months of nifedipine therapy. The relationship of PROCARDIA therapy is uncertain. These laboratory abnormalities have already been associated with clinical symptoms. Cholestasis, possibly due to PROCARDIA therapy, has been reported twice in the extensive world literature.

One of the major adverse variables associated with PROCARDIA overdosage, available data suggest that gross overdosage could result in excessive peripheral vasodilation with subsequent marked and probably prolonged systemic hypotension. Clinically significant hypotension due to PROCARDIA overdosage calls for active cardiovascular support including monitoring of cardiac and respiratory function, elevation of extremities, and attention to circulatory fluid volume and urine output. A vasoconstrictor (such as norepinephrine) may be helpful in restoring vascular tone and blood pressure, provided that there is no contraindication to its use. Clearance of PROCARDIA is enhanced by the administration of diuretics.

PROCARDIA is highly toxic to fish. It is also highly toxic to birds and to mammals.

DOSAGE AND ADMINISTRATION: The dosage of PROCARDIA needed to suppress angina and that can be tolerated by the patient must be established by titration. Excessive doses can result in hypotension.

The starting dose is one 10 mg capsule, swallowed whole, 3 times/day. The usual effective dose range is 10–20 mg three times daily. Some patients, especially those with evidence of coronary artery spasm, respond only to higher doses, more frequent administration, or both. In such patients, doses of 20–30 mg three or four times daily may be effective. Doses above 120 mg daily are rarely necessary. More than 180 mg per day is not recommended.

In most cases, PROCARDIA titration should proceed over a 7-14 day period so that the physician can assess the response to each dose level and monitor the blood pressure before proceeding to higher doses.

If symptoms so warrant, titration may proceed more rapidly provided that the patient be assessed frequently. Based on the patient's physical activity level, attack frequency, and sublingual nitroglycerin consumption, the dose of PROCARDIA may be increased from 10 mg t.i.d. to 20 mg t.i.d. and then to 30 mg t.i.d. over a three-day period.

In hospitalized patients under close observation, the dose may be increased in 10 mg increments over four to six-hour periods as required to control pain and arrhythmias due to ischemia. A single dose should rarely exceed 30 mg.

No "rebound effect" has been observed upon discontinuation of PROCARDIA. However, if continuation of PROCARDIA is necessary, sound clinical practice suggests that the dose should be decreased gradually with close physician supervision.

Co-Administration with Other Anticardiac Drugs: Sublingual nitroglycerin may be taken required for the control of acute manifestations of angina, particularly during PROCARDIA treatment. See Precautions, Drug Interactions for information on co-administration of PROCARDIA with beta blockers or long-acting nitrates.

HOW SUPPLIED: Each orange, soft gelatin PROCARDIA Capsule contains 10 mg of nifedipine. PROCARDIA Capsules are supplied in amber glass bottles of 100 capsules (NDC 0069-2600-04).

The capsules should be protected from light and moisture and stored at controlled room temperature 59° to 77°F (15° to 25°C) in the manufacturer's original container.

Issued January 1982

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ANESTHESIOLOGY

March 11-14—**Obstetrical Anesthesia: The State of the Art, 1982.** UCSF at Golden Gateway Holiday Inn, San Francisco. Thursday-Sunday. 13 hrs. \$275.

March 14-18—**International Anesthesia Research Society—56th Congress.** Hilton Hotel, San Francisco. Sunday-Thursday. Contact: International Anesthesia Research Soc., 3645 Warrensville Center Rd., Cleveland, OH 44122. (216) 295-1124.

March 17-21—**American Society of Regional Anesthesia.** Del Monte Hyatt, Monterey. Wednesday-Sunday. 16 hrs. \$175. Contact: Gale Thompson, MD, ASRA, P.O. Box 11083, Richmond, VA 23230. (804) 358-0305.

March 21-26—**Anesthesiology 1982—8th Annual Winter Meeting.** Anesthesiology Educational Foundation at Sierra Nevada Inn, Mammoth Lakes. Sunday-Friday. Contact: AEF, P.O. Box 24230, Los Angeles 90024.

April 3-10—**10th Obstetric Anesthesia Conference.** Dept. of Anesthesiology, Ohio State Univ. College of Medicine, at Sheraton Waikiki, Oahu, Hawaii. One week. 25 hrs. Contact: Dept. of Anesthesiology, c/o Bradford Travel, 1200 W. Henderson Rd., Columbus, OH 43220. (614) 457-9990 or (614) 421-8487 (OSU).

April 26-30—**6th Annual Hawaiian Seminar on Clinical Anesthesiology.** Calif. Society of Anesthesiologists at Maui Surf Hotel, Maui. Monday-Friday. 20 hrs. Contact: Educational Programs Div., CSA, 100 E. Ellsworth Ave., Suite 806, San Mateo 94401. (415) 348-1407.

May 22-23—**Hemodynamic Monitoring/Pulmonary Artery Catheterization—Hands-on Workshops.** Calif. Soc. of Anesthesiologists and Stanford at Stanford. Saturday-Sunday. 15 hrs. \$275, CSA members; \$325, nonmembers. Contact: Educational Prog. Div., CSA, 100 S. Ellsworth Ave., Suite 806, San Mateo 94401. (415) 348-1407.

May 10-13—**California Society of Anesthesiologists—Annual Meeting.** Town and Country, San Diego. Thursday-Sunday. Contact: Educational Prog. Div., CSA, 100 S. Ellsworth Ave., Suite 806, San Mateo 94401. (415) 348-1407.

May 24-26—**Practical Closed Circuit Anesthesia II.** Pacific Medical Center at Hyatt at Union Square, San Francisco. Thursday-Saturday. 17 hrs. \$300. Contact: Office of Continuing Med. Ed., PMC, P.O. Box 7999, San Francisco 94120. (415) 563-3221, ext. 2761.

August 21-22—**Hemodynamic Monitoring/Pulmonary Artery Catheterization—Hands-on Workshops.** Calif. Soc. of Anesthesiologists and Stanford at Stanford. Saturday-Sunday. 15 hrs. \$275, CSA members; \$325, nonmembers. Contact: Educational Prog. Div., CSA, 100 S. Ellsworth Ave., Suite 806, San Mateo 94401. (415) 348-1407.

CANCER

February 17—**Advances in Cancer Detection.** Hospital of the Good Samaritan at Biltmore Hotel, Los Angeles. Wednesday. 7 hrs. Contact: Bonnie VanWaardenburg, Cancer Symp., Hosp. of the Good Samaritan, 616 S. Witmer St., Los Angeles 90017. (213) 977-2345.

February 24-26—**Current Approaches to Radiation Oncology, Biology and Physics.** UCSF. Wednesday-Friday.

February 27-28—**Breast Cancer: Conservation Surgery and Radiation Therapy Now—17th Annual San Francisco Cancer Symposium.** West Coast Cancer Fdn.; Am. Cancer Soc., Calif. Div.; St. Mary's Hosp. and Med. Ctr. at Sheraton Fisherman's Wharf, San Francisco. Saturday-Sunday. 12 hrs. \$115 before Jan. 1; \$140, thereafter. Contact: West Coast Cancer Fdn., 50 Francisco St., Suite 200, San Francisco 94133. (415) 981-4590.

March 25-27—**Western States Conference on Cancer Rehabilitation: Psychosocial, Physical and Economic Interventions.** No. Calif. Cancer Prog.; Am. Cancer Soc., Calif. Div.; UCLA Jonsson Comprehensive Cancer Ctr.; L.A. Co.-USC Comprehensive Cancer Ctr.; Community Cancer Control-

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KEY TO ABBREVIATIONS

- CMA:** California Medical Association
Contact: Continuing Medical Education, California Medical Association, 731 Market Street, San Francisco 94103. (415) 777-2000.
- DREW:** Charles R. Drew Postgraduate Medical School
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- USC:** University of Southern California
Contact: Phil R. Manning, MD, Associate Dean, Postgraduate Division, University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 90033. (213) 224-7051.

L.A.; S.F. Regional Cancer Fndn. at Fairmont Hotel, San Francisco. Thursday-Saturday. Contact: Carrie Ewing, No. Calif. Cancer Prog., P.O. Box 10144, Palo Alto 94303. (415) 497-7431.

April 2-7—**Hematology/Oncology Update.** See Medicine, April 2-7.

April 3—**Oncology Update 1982.** Northridge Hospital Medical Center at Biltmore Hotel, Los Angeles. Saturday. 8 hrs. \$125. Contact: Sandra Rozzen, Med. Ed. Dept., NHMC, 18300 Roscoe Blvd., Northridge 91328. (213) 885-5311.

April 22-24—**Bladder Cancer.** American Urological Assn. at Biltmore Hotel, Los Angeles. Thursday-Saturday. 16 hrs. Contact: Alice Henderson, AUA Office of Education, P.O. Box 25147, Houston, TX 77005.

EMERGENCY MEDICINE

February 20—**Trauma Radiology for the Emergency Practitioner.** Calif. Chap., American College of Emergency Physicians, at St. Mary Medical Center, Long Beach. Saturday. 8 hrs. \$75. ACEP members; \$95, nonmembers. Contact: CAL/ACEP, 8639 Lincoln Blvd., Suite 240, Los Angeles 90045. (213) 776-1820.

February 28-March 5—**Emergency Medicine.** UCD at Hyatt, Lake Tahoe. Sunday-Friday.

March 7-10—**Sports Injuries Update.** UCD at Hyatt, Lake Tahoe. Sunday-Wednesday.

March 14-19—**Third Annual Mammoth Mountain Emergency Medicine Ski Conference.** UCI at Mammoth Lakes. Sunday-Friday. 25 hrs. \$290. Contact: Medical Conferences, Inc., P.O. Box 52-B, Newport Beach 92662. (714) 540-9876.

March 15-19—**Postgraduate Institute for Emergency Room Physicians, Symposium I.** UCSD at Islandia Hotel, San Diego. Monday-Friday. 36 hrs. \$425.

April 10-17—**Pediatric Emergencies.** UCSD at Kauai, Hawaii. One week. 21 hrs. \$325.

April 23-25—**Advanced Cardiac Life Support Workshops.** Emergency Medical Systems, Inc., at Ralph K. Davies Medical Center, San Francisco. Friday-Sunday. Contact: EMS, Inc., 2310 Mason St., San Francisco 94133.

April 24-May 2—**Emergency Medicine.** USC at Hawaii. One week. 25 hrs. \$425.

May 10-14—**Postgraduate Institute for Emergency Room Physicians, Symposium I.** UCSD. Monday-Friday. 36 hrs. \$425.

June 7-11—**Postgraduate Institute for Emergency Room Physicians—Symposium III.** UCSD at Islandia Hyatt, San Diego. Monday-Friday. 36 hrs. \$425.

June 28-July 2—**Topics in Emergency Medicine.** UCSF. Monday-Friday. 35 hrs. \$350.

July 23-25—**Advanced Cardiac Life Support Workshops.** Emergency Medical Systems, Inc., at Ralph K. Davies Medical Center, San Francisco. Friday-Sunday. Contact: EMS, Inc., 2310 Mason St., San Francisco 94133.

August 9-13—**Postgraduate Institute for Emergency Room Physicians—Symposium II.** UCSD at Islandia Hyatt, San Diego. Monday-Friday. 36 hrs.

DIAGNOSTIC MEDICINE

February 16-19—**Clinical Investigation.** See Of Interest to All, February 16-19.

February 17-19—**Recent Advances in Noninvasive Cardiac Imaging: Applications in the Diagnosis and Management of Ischemic Heart Disease.** American College of Cardiology at Century Plaza Hotel, Los Angeles. Wednesday-Friday. Contact: Registration Secretary, Extramural Prog. Dept., ACC, 11 Old Georgetown Rd., Bethesda, MD 20014. (301) 897-0000.

February 18-20—**Controversies and Problem Solving With Endoscopy—An Update.** So. Calif. Society for Gastrointestinal

Endoscopy at Beverly Hilton Hotel, Beverly Hills. Thursday-Saturday. 18 hrs. Contact: Dr. Albert Dreskin, 13652 Cantara St., Panorama City 91402.

February 20-27—**Cardiology.** Univ. of Washington School of Medicine at Wailea Beach, Maui. One week. Contact: Univ. of WA Sch. of Med., Div. of CME, SC-50, Seattle 98195. (206) 543-1050.

February 21-23—**Recent Advances in Clinical Endocrinology.** UCSF. Sunday-Tuesday.

February 24-25—**American College of Physicians—Regional Meeting.** Hilton, Beverly Hills. Wednesday-Thursday. Contact: Mitchel D. Covell, MD, 9730 Wilshire Blvd., Beverly Hills 90212.

February 25-28—**Federation of the Western Societies of Neurological Science.** Hotel del Coronado, Coronado. Thursday-Sunday. 15 hrs. Contact: Renee Kaseff, 525 Hurlingham Ave., San Mateo 94402. (415) 344-9082.

February 26—**A Day in Nephrology.** Sutter Community Hospitals at Holidome Convention Center, Sacramento. Friday. 7 hrs. Contact: Barbara Davis, (916) 446-6667.

February 26-27—**American College of Physicians—Regional Meeting.** Doubletree Inn, Monterey. Friday-Saturday. Contact: Jerry P. Lewis, MD, 618 Francisco Place, Davis 95616.

February 26-28—**Arrhythmias and Cardiac Ischemia: Diagnosis and Management.** International Medical Education Corp. at Aladdin Hotel, Las Vegas. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.

February 27-28—**Immunology.** STAN. Saturday-Sunday. 12 hrs. \$225.

February 27-28—**Basic Neuroscience.** STAN. Saturday-Sunday. 12 hrs. \$225.

February 27-28—**Asthma: Impact and Strategies for Change.** UCLA. Saturday-Sunday. 14 hrs. \$85.

March 3-6—**Third World Congress for Bronchology.** World Assn. for Bronchology and American College of Chest Physicians at Town and Country, San Diego. Wednesday-Saturday. \$250, WAB and ACCP members; \$300, nonmembers. Contact: ACCP, P.O. Box 93826, Chicago 60670. (312) 698-2200.

March 3-6—**Immunology and the Clinical Practice of Allergy—6th Annual Course.** UCSD at Hilton Hotel, San Diego. Wednesday-Saturday. 20 hrs.

March 3-6—**Third World Congress for Bronchology.** American College of Chest Physicians and World Assn. for Bronchology at Town and Country Hotel, San Diego. Wednesday-Saturday. \$250, ACCP and WAB members; \$300, nonmembers. Contact: ACCP, P.O. Box 93826, Chicago 60670. (312) 698-2200.

March 5—**Diabetes.** UCD at Red Lion Inn, Sacramento. Friday.

March 7-10—**Basic Cardiology for the Practicing Physician.** UCSF at Lake Tahoe. Sunday-Wednesday.

March 10—**Hypothyroidism—Unmasked.** LLU. Wednesday. 4 hrs. \$30.

March 12-13—**Exercise Stress Testing: Today and Tomorrow.** American College of Cardiology at Memorial Hospital Medical Center, Long Beach. Friday-Saturday. Contact: Registration Secretary, Extramural Prog. Dept., ACC, 9111 Old Georgetown Rd., Bethesda, MD 20014. (301) 897-5400.

March 12-13—**Clinical Management of Coronary Disease and Exercise Testing.** International Medical Education Corp. at Sheraton at the Wharf, San Francisco. Friday-Saturday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.

March 12-14—**Western Institute on Epilepsy.** UCLA at Marriott, Los Angeles. Friday-Sunday. \$60.

March 13-20—**Reproductive Endocrinology.** USC at Maui. One week. \$395.

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- March 19-20—Non-Invasive Cardiology Conference. Clairemont Community Hospital at Sheraton Harbor Island Hotel, San Diego. Friday-Saturday. Contact: Nomi Feldman, 3770 Tansy, San Diego 92121. (714) 453-6222.
- March 21-24—Dermatology Consultants' Course. UCSF at Yosemite. Sunday-Wednesday.
- March 22-April 2—30th Annual Review of Internal Medicine. USC. 12 days.
- March 26-28—EKG Interpretation and Arrhythmia Management. International Medical Education Corp. at Sahara Hotel, Las Vegas. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- March 29-April 2—Management of Coronary Heart Disease: Medical, Surgical, Exercise. UCSD at Hilton, San Diego. Monday-Friday. 40 hrs.
- April-June—Allergy/Immunology for the Practicing Internist. UCLA. Wednesday evenings.
- April 1-3—Asthma Update—1982. Memorial Hospital Medical Center-UCI Center for Health Education, Long Beach. Thursday-Saturday. 19 hrs. Contact: Asst. Dir., Ctr. for Health Education, 2801 Atlantic Ave., Long Beach 90801. (213) 595-3811.
- April 1-4—Principles in the Practice of Allergic Diseases in Adults and Children. UCD at Del Monte Hyatt, Monterey. Thursday-Sunday.
- April 2-7—Hematology/Oncology Update. UCD at Ahwahnee Hotel, Yosemite. Friday-Wednesday.
- April 3—Cardiology Update for the Practicing Physician. American Heart Assn.-Greater Los Angeles Affiliate, San Gabriel Valley Division, at Huntington Sheraton, Pasadena. Saturday. 8 hrs. \$55, members; \$70, nonmembers. Contact: Gary L. Kosky, AHA, 929 N. Grand Ave., Covina 91724. (213) 339-7382 or (213) 686-2506.
- April 14—Cardiology Update 1982. N. T. Enloe Memorial Hospital, Chico. Wednesday. 6-7 hrs. \$35. Contact: Med. Staff Office, Enloe Hosp., W. 5th Ave. and The Esplanade, Chico 95926. (916) 891-7375.
- April 16—Injectable Collagen—Applications and Technique. STAN. Friday. \$100. Contact: Paul H. Jacobs, MD, Dept. of Dermatology, Stanford Univ. Sch. of Med., Stanford 94305. (415) 497-6101.
- April 16-17—Recent Advances in Renal, Metabolic and Endocrine Disorders. St. Francis Medical Center at Bonaventure Hotel, Los Angeles. Friday-Saturday. \$115. Contact: Allan M. Hoffman, EdD, Dir., Med. Ed., St. Francis Med. Ctr., 3630 E. Imperial Highway, Lynwood 90262. (213) 603-6171.
- April 16-18—Arrhythmias and Cardiac Ischemia: Diagnosis and Management. International Medical Education Corp. at Sheraton, Anaheim. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- April 22-23—Infectious Disease Symposium. Epidemiology Assn. of Greater Sacramento and Mercy Hospital at Red Lion Inn, Sacramento. Thursday-Friday. 14 hrs. Contact: Office of Cont. Med. Ed., Mercy General Hospital, 4001 J St., Sacramento 95819. (916) 453-4545.
- April 25-28—Dermatology. UCD at Ahwahnee Hotel, Yosemite. One week.
- April 28—Thyroid '82. Hospital of the Good Samaritan at Bonaventure Hotel, Los Angeles. Wednesday. 7 hrs. Contact: Bonnie VanWaardenburg, Coordinator of Symposia, Hosp. of the Good Samaritan, 616 S. Witmer St., Los Angeles 90017. (213) 977-2345.
- April 6-7—Advances in Infectious Diseases. UCSF. Thursday-Friday. 14 hrs. \$170.
- April 7-8—Common Nervous System Pathology Diagnosis and Treatment. Memorial Hospital Medical Center-UCI Center for Health Education, Long Beach. Friday-Saturday. 14 hrs.

Contact: Asst. Dir., Ctr. for Health Ed., 2801 Atlantic Ave., Long Beach 90801. (213) 595-3811.

- May 7-9—Ambulatory Electrocardiography: Clinical Applications, Methodology and Interpretation. International Medical Education Corp. at MGM Grand, Las Vegas. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- May 15-18—American Thoracic Society—Annual Scientific Meeting. Bonaventure Hotel, Los Angeles. Saturday-Tuesday. 30 hrs. \$35, members; \$100, nonmembers. Contact: S. R. Iannotta, Exec. Dir., ATS, 1740 Broadway, New York 10019. (212) 245-8000.
- May 17-21—Advances in Internal Medicine. UCSF. Monday-Friday. 40 hrs. \$375.
- May 21-22—EKG Interpretation and Arrhythmia Management. International Medical Education Corp. at Sheraton at the Wharf, San Francisco. Friday-Saturday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- May 27-30—4th Annual Refresher Course in Allergy and Asthma. UCD at Marriott's Great America, Santa Clara. Thursday-Sunday.
- June 7-9—Clinical Echocardiography—1982: M-Mode, 2-Dimensional and Pulse Doppler Techniques. American College of Cardiology at Sheraton Harbor Island Hotel, San Diego. Monday-Wednesday. Contact: Extramural Prog. Dept., ACC, 9111 Old Georgetown Rd., Bethesda, MD 20014.
- June 9—Bleeding Disorders. LLU. Wednesday. 4 hrs. \$30.
- June 11-13—Arrhythmias and Cardiac Ischemia: Diagnosis and Management. International Medical Education Corp. at Aladdin Hotel, Las Vegas. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- June 25-27—Clinical Management of Coronary Disease and Exercise Testing. International Medical Education Corp. at Newporter Inn, Newport Beach. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- July 16-17—Arrhythmias and Cardiac Ischemia: Diagnosis and Management. International Medical Education Corp. at Sheraton at the Wharf, San Francisco. Friday-Saturday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- July 17-24—Cardiovascular Medicine and Surgery: An Advanced Course. STAN at Mauna Kea Beach Hotel, Kamuela, Hawaii. One week. 21 hrs. \$325.
- August 6-8—EKG Interpretation and Arrhythmia Management. International Medical Education Corp. at Clouds-Cal Neva Resort, Lake Tahoe. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- August 13-15—Clinical Management of Coronary Disease and Exercise Testing. International Medical Education Corp. at Doubletree Inn, Monterey. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- August 20-22—Ambulatory Electrocardiography: Clinical Applications, Methodology and Interpretation. International Medical Education Corp. at Hyatt, Anaheim. Friday-Sunday. 13 hrs. \$245. Contact: Stephen E. Mattingly, IMEC, 64 Inverness Dr. E., Englewood, CO 80112. (800) 525-8651.
- August 30-September 4—Fifth Comprehensive Nephrology Review Course. UCLA at Marriott, Los Angeles. Monday-Saturday. 28½ hrs. \$595.

OBSTETRICS AND GYNECOLOGY

- March 13-20—Reproductive Endocrinology, Infertility and Contraception. See Of Interest To All, March 13-20.
- March 14-17—OB/GYN for the Practicing Physician. UCSF at Yosemite. Sunday-Wednesday.

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cations with anticoagulant drugs. A brief update on the diagnosis of pulmonary embolism is therefore included in this series of epitomes on physical medicine and rehabilitation.

Current practice in suspected PE may include initiation of anticoagulation on clinical criteria alone. However, physical signs and symptoms typically are nonspecific. More commonly, treatment is begun after arterial blood gas studies and ventilation-perfusion (\dot{V}/\dot{Q}) lung scanning. However, these approaches may result in misdiagnosis and inappropriate and hazardous treatment in many cases. A low arterial oxygen pressure (PO_2) may be present with a variety of acute or chronic lung diseases while a normal PO_2 may occur in up to 15 percent of patients with documented PE. \dot{V}/\dot{Q} scanning has been regarded as an adequate screening test for PE in terms of sensitivity and specificity, although a recent report questions the validity of this concept. False-positive findings on \dot{V}/\dot{Q} scans are common, occurring in from 60 percent to 80 percent of cases when pulmonary angiography is used to confirm the presence of PE. False-negative findings of PE on \dot{V}/\dot{Q} scans, however, are rare. Thus, normal findings on \dot{V}/\dot{Q} scan virtually rule out the presence of PE if done between 24 and 72 hours from onset of symptoms.

The diagnosis of PE usually leads to such treatment as administration of anticoagulant drugs or vena cava ligation, both of which may have serious

complications. Thus, pulmonary angiography to assure that PE is present is recommended in situations where PE is suspected and the \dot{V}/\dot{Q} scan is positive for PE. These situations include cases in which patients have parenchymal lung disease or abnormalities in both ventilation and perfusion scans (because of the very high rate of false-positive scans), and cases in which patients are being considered for vena cava ligation or in whom anticoagulant drugs are contraindicated or who are at high risk for complications from anticoagulation therapy.

The importance of pulmonary angiography to confirm the presence of PE in patients at high risk for complications from anticoagulation therapy is just beginning to be realized. Carrying out potentially dangerous therapy in a patient who does not require it is hazardous. Heparin is the leading cause of adverse drug reactions in patients in hospital and anticoagulant drugs taken orally pose similar problems. Although pulmonary angiography is not a screening procedure, it is the procedure of choice for confirming the diagnosis of PE in high-risk patients.

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REFERENCES

- Giudice JC, Komansky HJ, Gordon R: Pulmonary thromboembolism—1. Current concepts in pathogenesis and diagnosis. *Postgrad Med* 67:64-71, 74-75, 77, May 1980
- Robin ED: Overdiagnosis and overtreatment of pulmonary embolism: The emperor may have no clothes. *Ann Intern Med* 87:775-781, Dec 1977
- Viamonte M Jr, Koolpe H, Janowitz W, et al: Pulmonary thromboembolism—Update. *JAMA* 243:2229-2234, Jun 6, 1980

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